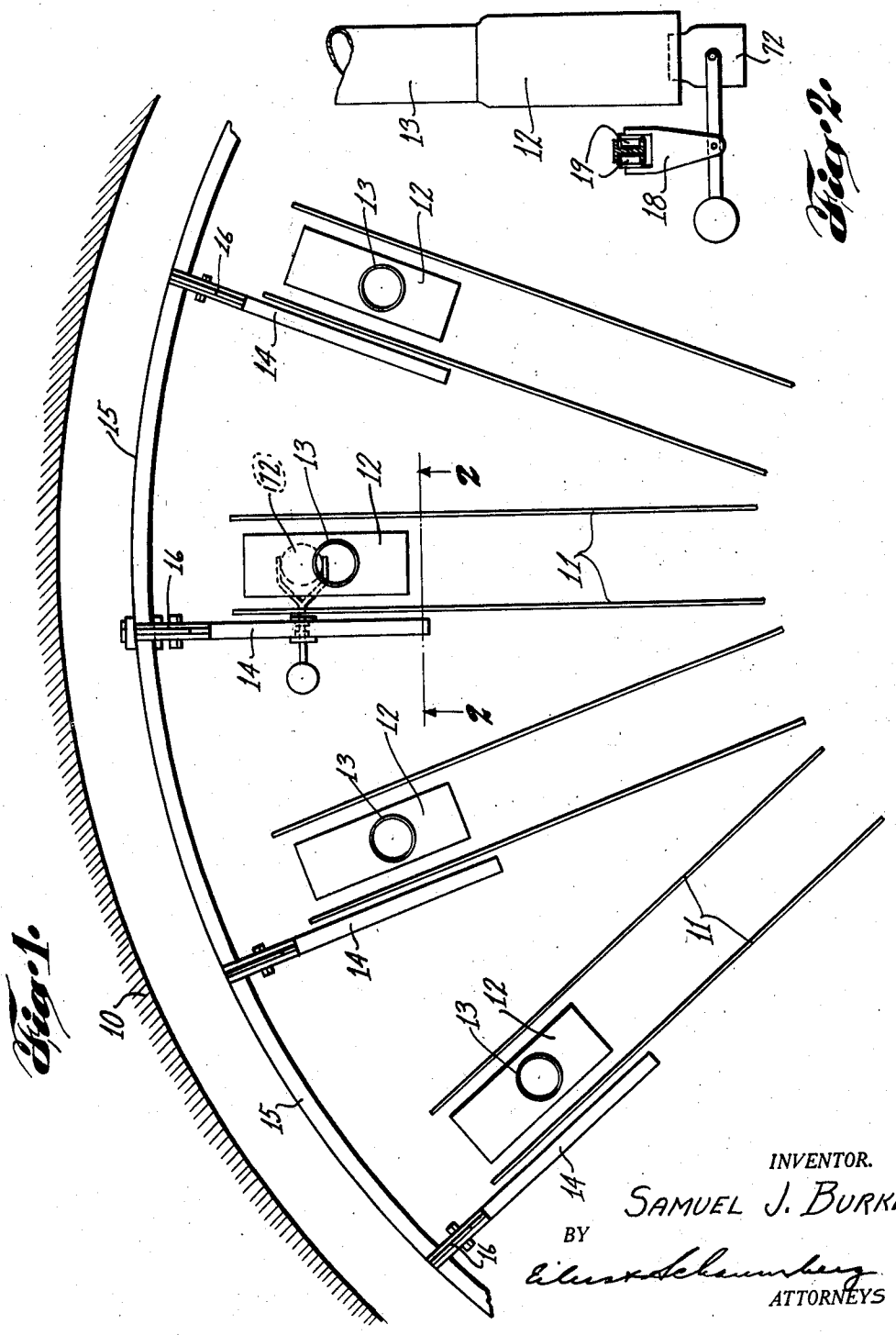
April 2, 1935. S. J. BURKE 1,996,142

CONVEYER

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CONVEYER

Filed June 20, 1932 7 Sheets-Sheet 2

Fig. 4.

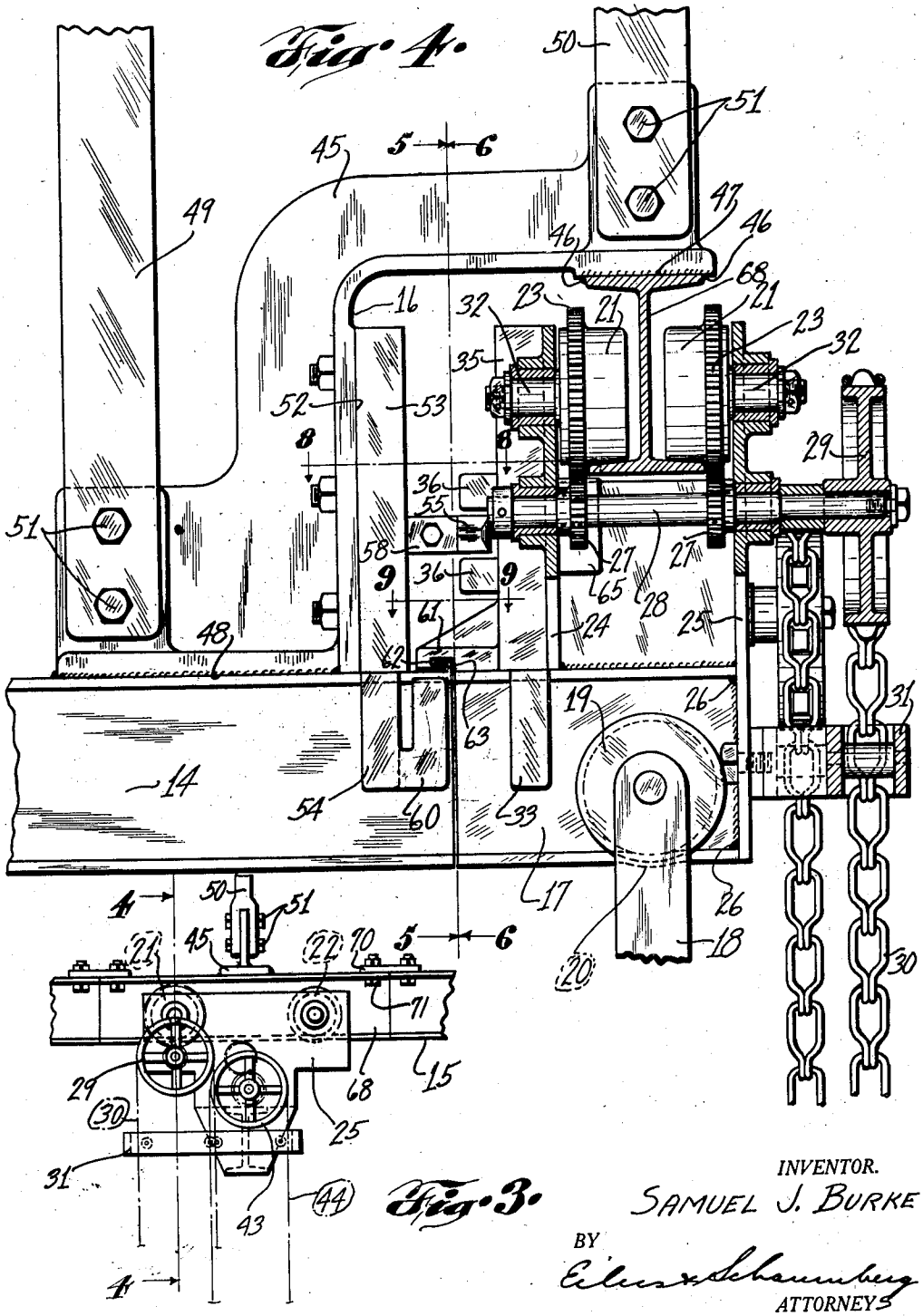


Fig. 3.

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Filed June 20, 1932 7 Sheets-Sheet 3

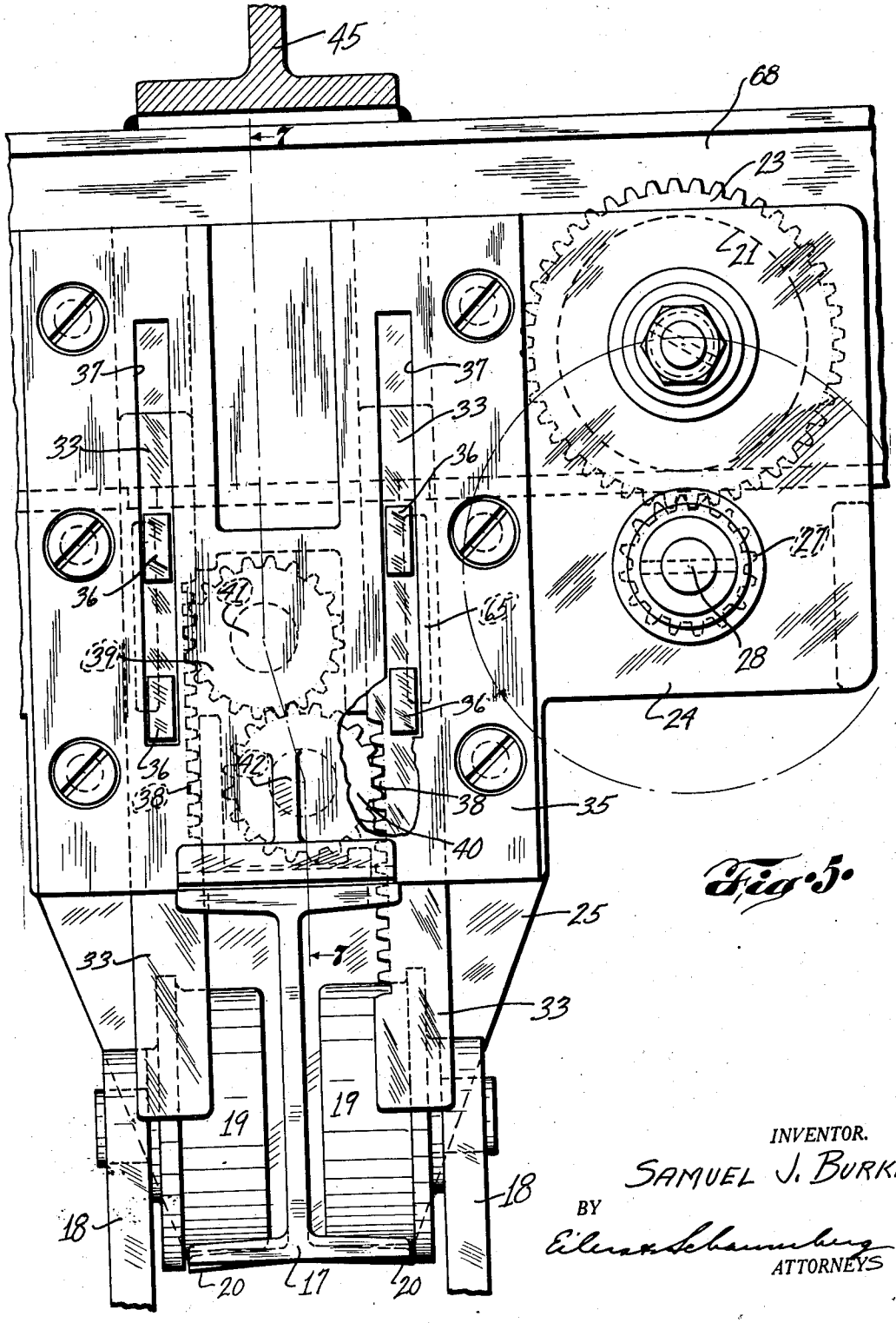


Fig. 5.

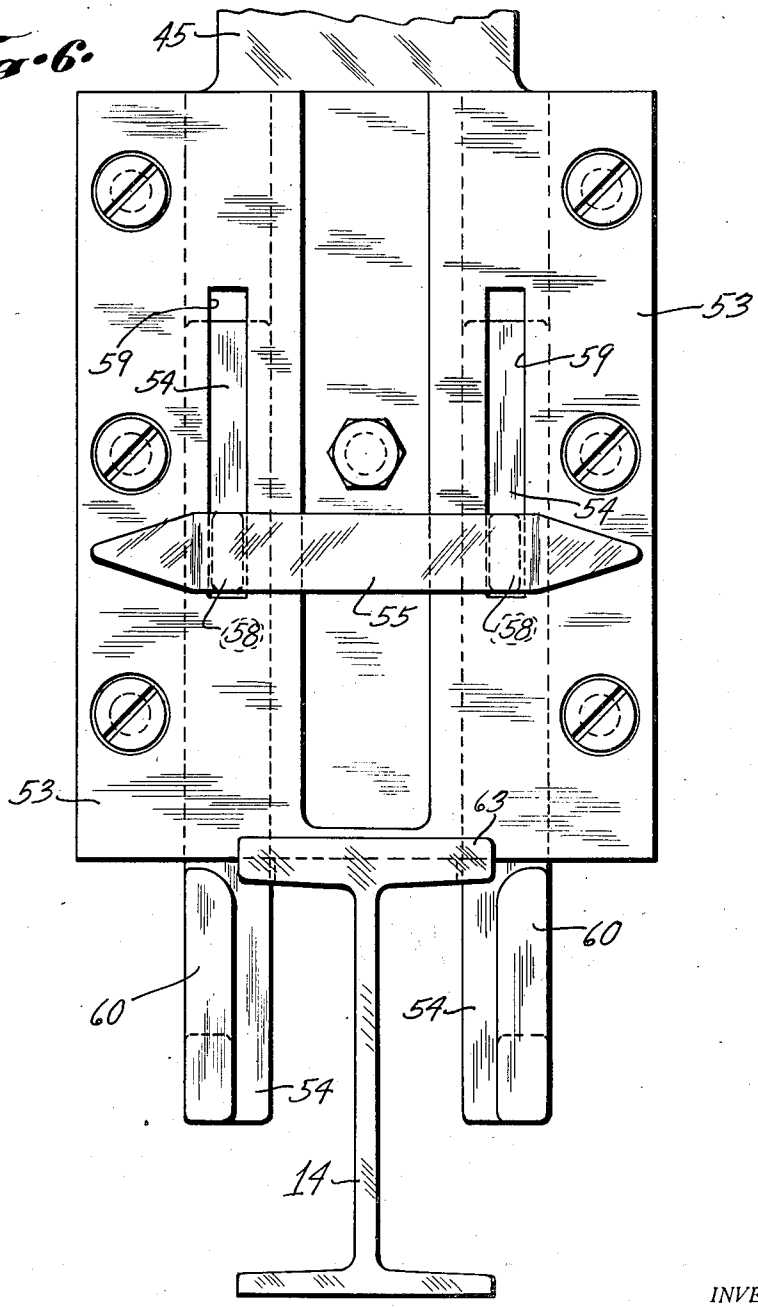
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CONVEYER

Filed June 20, 1932 7 Sheets-Sheet 4

Fig. 6.



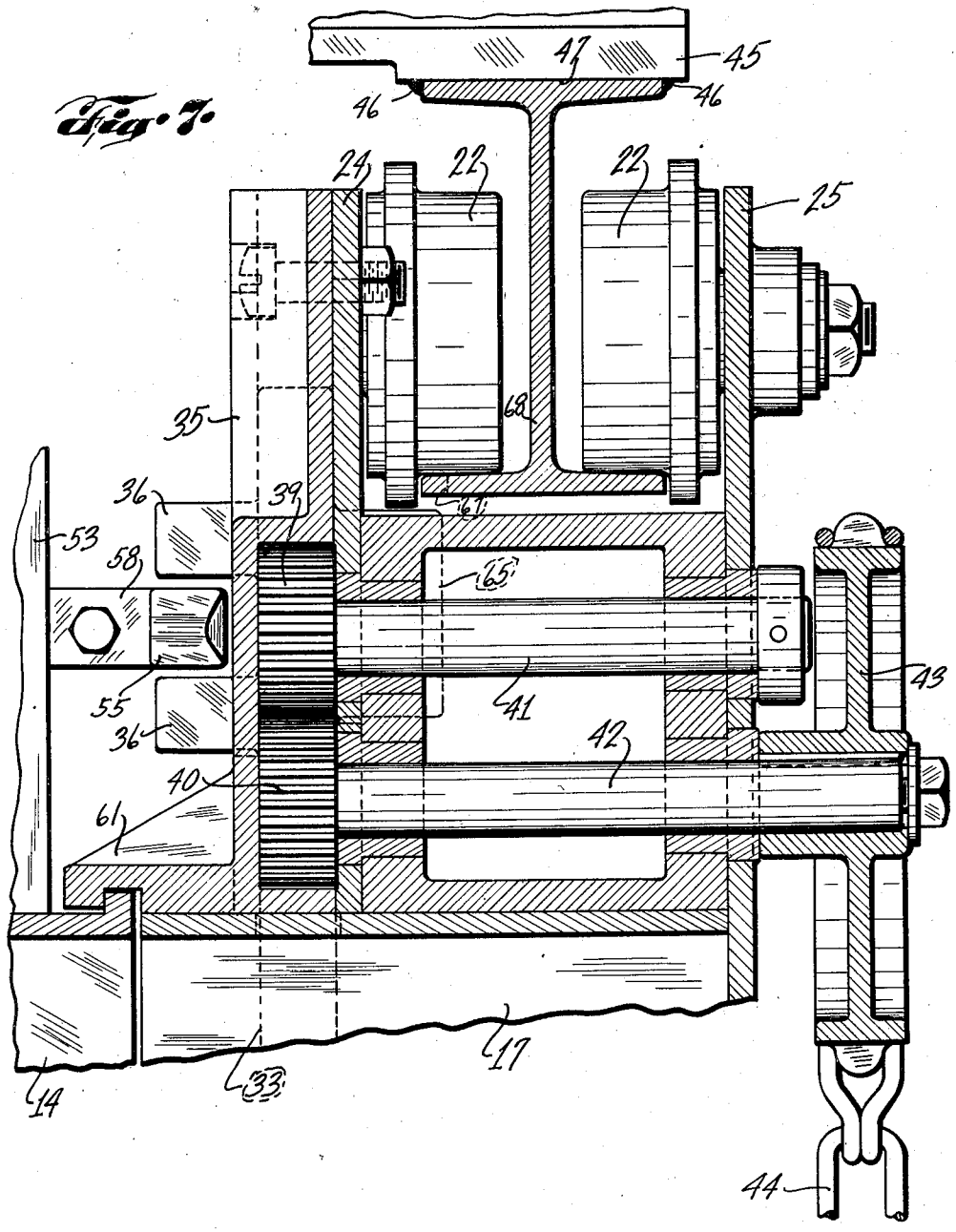
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Filed June 20, 1932 7 Sheets-Sheet 5

Fig. 7.



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CONVEYER

Filed June 20, 1932 7 Sheets-Sheet 6

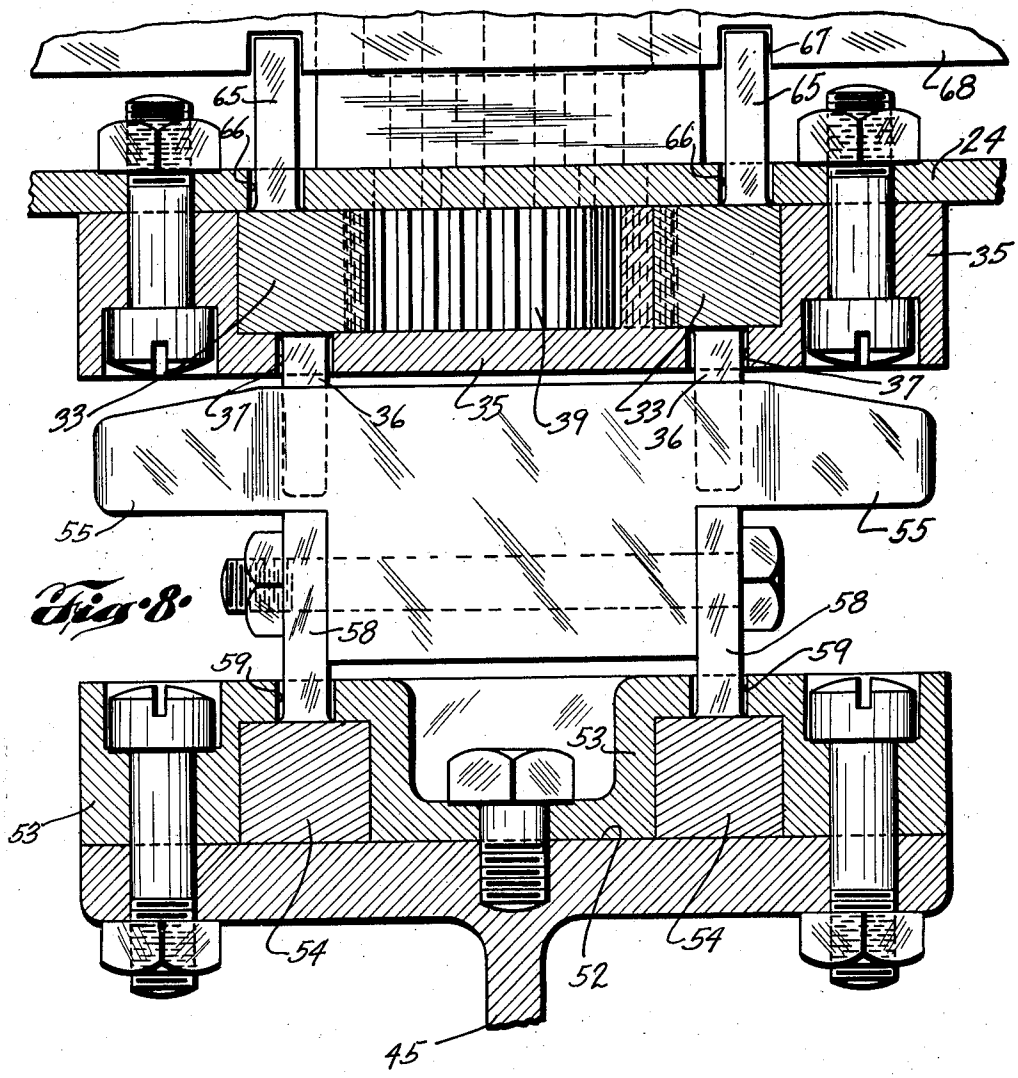


Fig. 8.

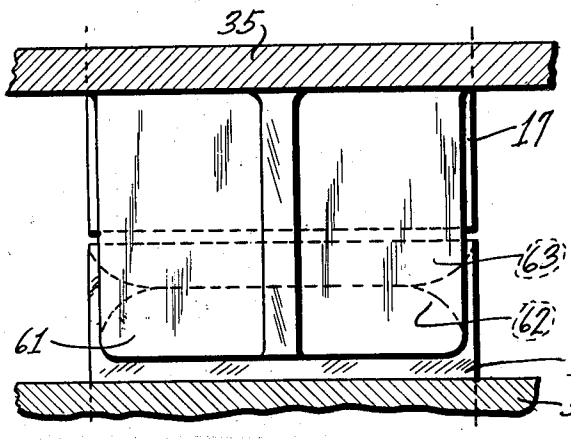


Fig. 9.

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CONVEYER

Filed June 20, 1932 7 Sheets-Sheet 7

Fig. 10.

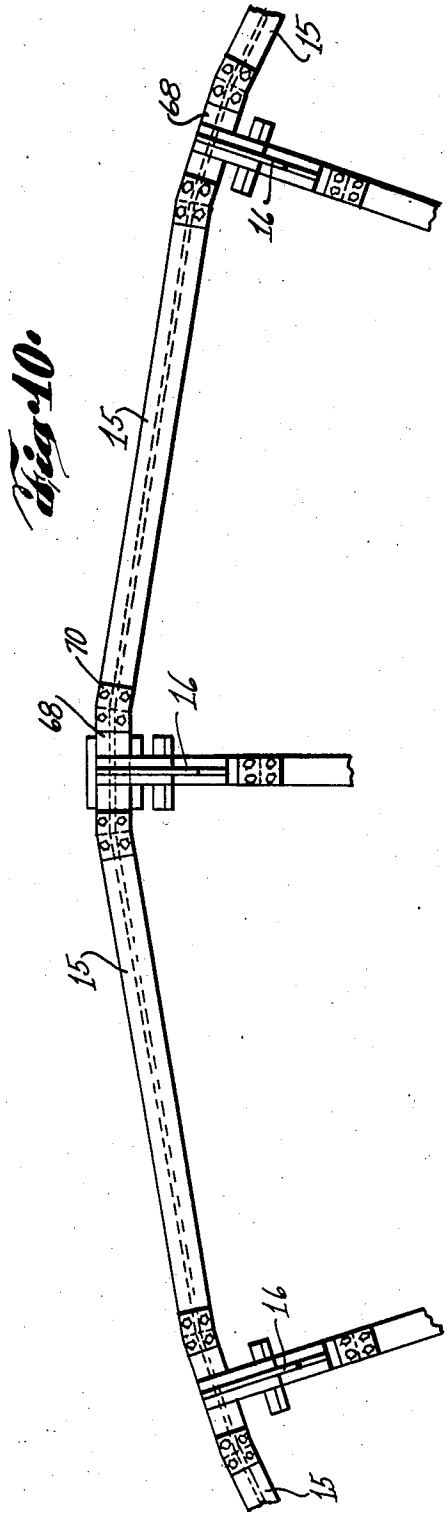
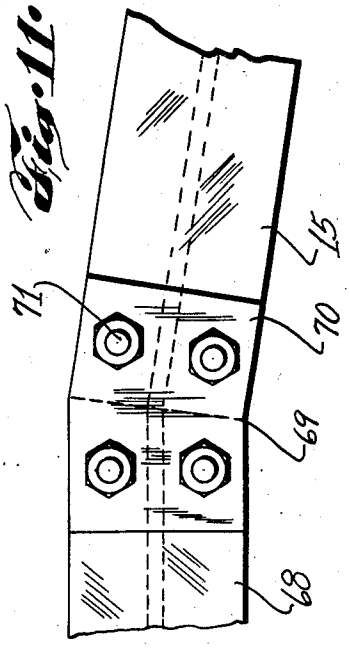


Fig. 11.



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UNITED STATES PATENT OFFICE

1,996,142

CONVEYER

Samuel J. Burke, St. Louis, Mo.

Application June 20, 1932, Serial No. 618,248

13 Claims. (Cl. 104—98)

This invention relates to improvements in conveyers, and more particularly to overhead conveyer installations in which suspended apparatus of heavy type, is to be transferred, by way of connecting trackage, to any one of a plurality of branch tracks. The apparatus to be described by way of exemplifying the present invention, is constructed to facilitate the transfer of blowers for force-drafting locomotives, from any one to any other of the several locomotive stalls of a roundhouse or the like.

In a railroad roundhouse, when a locomotive is being fired up prior to a run and before steam pressure has accumulated sufficiently to enable the use of the steam blower, it is customary to employ a portable blower, consisting essentially of a fan and an electric motor, the blower being usually applied over the stack of the locomotive, for inducing therethrough, an augmented draft. Blowers of this type are heavy, often weighing several hundred pounds. The expense of this equipment usually precludes an investment sufficient to provide a blower for each of the several roundhouse stalls. It is to the end of facilitating the transfer of such blowers, from stall to stall in a roundhouse, that the present invention has its general object.

It has heretofore been attempted, by utilizing various conveyers and transfer devices, to render locomotive blowers transferable from one to another of the different stalls of a roundhouse. Such transfer equipment has, however, been difficult of manipulation, complicated in construction, needlessly expensive, and unsafe, in that, in the absence of proper safety expedients, the blowers have been permitted to fall from the transfer trackage, at great hazard to the operating personnel, and attendant damage to expensive equipment. The invention has as a further object, the elimination of these difficulties.

Heretofore equipment of the type referred to, has provided for switching, through the use of switch points generally resembling those employed in railroad work. Other expedients have been tried, all with considerable uncertainty as to switching, and attendant hazards and inefficiency. The present invention objectively eliminates any uncertainty in switching from a connecting track to a radial or spur track, or vice versa.

A further object of the invention is attained in an arrangement whereby an improved interlock or gate mechanism, serves positively to prevent travelling movement of the apparatus, when in transferring position, as well as precluding transfer of the conveyed apparatus when in any other than an intended transfer location.

A further object of the invention is attained in an improved transfer trackage arrangement such that the apparatus, during its movement between different radial or stall tracks, is carried on an individual track section, movable into positive alignment or register with any of the lateral tracks to which the apparatus is to be transported.

Other general objects may be stated as the provision of mechanism for the purpose noted, which is more simple, rugged and durable than devices, for a comparable purpose, heretofore available; a construction such that the apparatus may be formed almost entirely of standard stock materials, and the trackage constructed of conventional structural steel shapes, such for example as I bars or beams.

Further and additional objects will appear from the following detailed description of a selected installation, and from the accompanying drawings illustrating such installation, and in which:

Fig. 1 is a fragmentary view of a portion of a roundhouse, showing schematically, and in plan, a usual arrangement of the several locomotive stalls, smoke jacks over a portion thereof, stall tracks alongside the several jacks, and an arcuate track interconnecting the several stall tracks, and arranged substantially at a right angle thereto; Fig. 2 is a diagrammatic representation, as viewed along line 2—2 of Fig. 1, of a blower of a general type heretofore utilized for the purpose aforesaid, the blower being shown as used in connection with a draft hood or jack; Fig. 3 is a side elevation of a transfer trolley or carriage, by which a blower or other apparatus may be transported; Fig. 4 is a sectional elevation along line 4—4 of Fig. 3, through a portion of the transfer carriage, and illustrating particularly the mechanism for propelling the carriage; Fig. 5 is a vertical sectional elevation taken at a right angle to the showing of Fig. 4, and as viewed along line 5—5 of Fig. 4; Fig. 6 is a vertical sectional elevation also at a right angle to the showing of Fig. 4, and as viewed along line 6—6 of Fig. 4; Fig. 7 is a fragmentary vertical sectional elevation, taken at a right angle to Fig. 5, and as viewed along line 7—7 of Fig. 5; Fig. 8 is a fragmentary horizontal section, as taken along line 8—8 of Fig. 4, Fig. 9 is a fragmentary horizontal section along line 9—9 of Fig. 4; Fig. 10 is a plan view illustrating a preferred track construction, and Fig. 11

is an enlarged top or plan view of a track-joint utilized according to the structure of Fig. 10.

Referring now by numerals of reference to the drawings, that portion of a roundhouse selected for typifying installation, includes a roundhouse wall 10 usually of circular or arcuate form, as shown, there being disposed within the structure a plurality of radially arranged stall tracks 11, utilized, as well known, for the storage and repair of locomotives. Above, and near the outer end of each of the locomotive stall tracks, is disposed a smoke jack or draft flue 12, equipped with a stack 13, usually directed outwardly of the building, to atmosphere. The structure as thus far described is, or may be, of any conventional construction, and is here mentioned simply by way of specifying a preferred purpose or use for the equipment to be hereinafter described.

Disposed in parallel adjacence to the outer ends of the several tracks 11 and in proximity to the smoke jacks 12, are the overhead, radially arranged laterals or spur tracks 14. These are interconnected, as appears from Fig. 1, by a communication track 15. The trackage 14 and 15 is conveniently formed of some available structural steel shape, such as I bar of conventional section. Interconnection between the track 15 and the several lateral tracks 14, is effected at spaced transfer stations 16, the stationary apparatus characterizing the present invention being located, in part, at the stations 16, and hereinafter described in detail.

The transfer trolley or carriage assembly includes a short section of track 17, forming a seat for the blower, while in transit, and mounted preferably below the remainder of the carriage, and in a position at substantially a right angle to its line of travel. The blower or other apparatus to be transferred from one point to another in the system, includes an upwardly extending hanger 18, (Fig. 2) which may be of furcate form as shown, and between the legs of which are carried rollers or trolley wheels 19 operating on one flange of the I bar, with the web thereof between the paired wheels. While a single pair of the wheels 19 are illustrated in Figs. 2 and 4, it is my preference to employ two such pairs, in spaced relation. It is my preference to provide a recess or depression 20, for each of the wheels 19, in the lower flange of the track section 17, to seat the pulleys 19, and thus prevent any oscillation thereof laterally of the carriage, while the carriage and blower are in transit.

Rolling movement of the carriage on the track 15, is effected through opposed pairs of wheels or rollers 21 and 22, the pair 21 being provided with gears 23 which may conveniently be formed integrally with the wheels 21, or secured thereto. The rotating elements 21—23, are journaled respectively in opposite vertical side or frame members 24 and 25, both secured, as by welding, to the track section 17 of the carriage, the frame member 25 being extended downwardly to cover the otherwise open outer end of the section 17, and being welded thereto as indicated at 26.

Rotation of the gears 23 is effected through a pair of spaced pinions 27, secured to a shaft 28, journaled in the side members 24 and 25, the shaft 28 projecting outwardly of the carriage to receive an actuating member, such as a sprocket 29. Actuation of sprocket 29 may be effected by an operator on the ground or floor level, as by an endless chain 30 operating through a guard member 31, serving to keep the actuating end of the chain 30 substantially in the plane of the teeth of the sprocket 29.

I have shown each of the paired wheels 21 and gears 23, as provided with an individual stub shaft 32, suitably journaled in the frame members 24 and 25. These journals, as well as other similar bearings in the assembly, may be lubricated in any suitable manner, being provided in present production, with high pressure grease gun fittings, (not shown).

As a means of positively preventing movement of the trolley wheels 19 off of the transverse track section 17, during the time the blower or similar apparatus is in transit, there are utilized a pair of gate or stop members 33 (Figs. 4 and 5). These members are slidably positioned between the frame member 24 and a companion housing portion 35, and are guided for vertical movement between the members 24 and 35, by opposed spaced jaw members 36 (Figs. 5 and 8), operating in vertical slots 37, the jaws serving, upon vertical movement of the members 33, as hereinafter appears, the purpose of lifting a companion gate or stop arrangement on the stationary parts of the structure. Actuation of the stop members 33 is effected through the agency of rack portions 38 formed on the opposed inside surfaces of the members 33, as best shown in Fig. 5. Disposed for operation between, and respectively in mesh with the opposed racks 38, are a pair of gate-actuating pinions 39 and 40. The pinions are carried by shafts 41 and 42, one of which, say 42, is a driving shaft, and projects outwardly of the carriage frame to receive a chain sprocket 43. The sprocket 43 may be remotely actuated by a continuous chain 44, preferably extending through the chain guard 31, and below the carriage, so as to be accessible for actuation by an operator on the floor level below.

The pinions 39 and 40 being enmeshed, will always rotate in opposite directions. It will thus be apparent that rotation of shaft 42 will always serve to move the gates 33 concurrently, lifting or lowering thereof being effected according to the direction of rotation of this shaft.

Proceeding now to a description of the equipment located at each of the transfer stations 16 (Fig. 1), I have shown as a means of positively and structurally uniting the communication trackage 15 and the laterals 14, a rigid bracket member 45. Each of the members 45 is preferably a casting, because of its rigidity. The I bars 15 constituting the communication or interconnecting trackage, are preferably welded as at 46, to an outer lower face 47 of the casting 45. A similar face 48 to which is welded or otherwise secured the track element 14, is shown as disposed at substantially a right angle to the face 47. Depending supports 49 and 50, secured as by bolts 51 to the transfer casting member 45, may be anchored at their opposite ends to the roof structure or other relatively rigid part of the building. It may here be noted as my distinct preference to support the trackage 14 and 15 entirely from the castings 45, which are suspended, in turn, from the building or like structure. This arrangement serves positively to prevent any unintended spacing or misalignment of the various sections of trackage, due to expansion, contraction or warping of the roof elements or other parts of the building structure.

Secured as by bolting, to a vertical face 52 of the casting member 45, is a gate guide element 53, serving guidingly to enclose a pair of spaced

gate or stop members 54 extending on opposite sides of the outer end of each lateral track 14, and thus effectively preventing the blower trolley wheels 19 from running off the track 14, in case the transfer trolley or carriage is not present or may not be in correct alignment to receive the blower.

Actuation of the gates 54 is effected by means of a lifting shoe 55 (Fig. 8) which, when the carriage is moved into transfer or switching position as in Fig. 4, extends between the vertically spaced paired jaws 36 associated with the gate members 33. The ends of the shoe 55 are preferably tapered as shown (Fig. 6) to facilitate their entrance between the paired jaws 36, as the carriage is moved into its switching or transfer position. The shoe 55 is carried by and between spaced lugs 58, each projecting outwardly of one of the stops or gates 54 and operating through a slot 59 in the housing member 53. It will appear from the manner of engagement of the shoe 55 by the lugs or jaws 36, that, as the jaws 36 are lifted or depressed, through the action of the racks 33 on gates 33, the gates 54 will be moved concurrently therewith.

Proceeding now to describe the arrangement for interlocking the carriage in transferring or switching position, together with the expedient for preventing opening of certain of the gates, except under predetermined conditions; the gate members 54 are provided with furcate outer extensions 60, normally occupying the operative position shown in Fig. 4. In this position the gates 54 are closed to bar any entrance to the lateral track 14, and will likewise prevent movement of the blower or other transfer structure therefrom. When, however, the stops or gates 54 are raised, the portions 60 rise at each side of the end of the track rail 14 for a purpose later appearing. The member 35 on the carriage, is provided with an arm or projection 61, (Figs. 4, 7 and 9), the lower or inner face of which is channeled so as to provide a curved vertical guide surface 62 (Fig. 9), coacting with an upstanding projection 63 carried at the upper outer extremity of rail 14; so that, as the carriage is moved into its switching or transfer position, the parts 62 and 63 coact to effect not only a proper alignment or register, but also a predetermined distance relation, as well as a positive interlock between the track portions 14, 15 and 17. From the relation of the arm 61 and the furcate ends 60 of the gates, it is seen to be impossible that the carriage may be moved into or out of switching position, except when the gates 54 are lowered, as in Fig. 4. Since these gates are actuated only concurrently with the gates 33, it will thus appear as impossible to lift the gates 33 in the event of misalignment of the traveling track section 17, with respect to any one of the laterals 14.

The gates 54, being not only lifted, but maintained in lifted position by the jaws 36 of the gates 33, the adjacent ends of track sections 14 and 17 are always guarded by the stops 54 and 33 except, of course, when the two sections are accurately aligned and it is desired to transfer the blower or other equipment onto or off of one of the lateral or stall tracks.

In addition to the coaction of projection 61 and the gates 54, to prevent movement of the transfer carriage away from the rail 14 when the stops or gates are raised, an additional independent arrangement attaining this result, consists, in the example disclosed, of a pair of projections or lugs 65. One of such lugs extends interiorly of the carriage from each of the gates or stops 33, (Fig. 8), there being provided for each lug 65 a suitable vertical slot 66 in the frame plate or member 24. In order for gates 33 to be lifted or actuated to a position to clear the track section 17, the carriage must be so positioned that the lugs 65 are disposed immediately beneath and in register with a pair of spaced notches 67. These notches are formed in the inner edge of the lower face of the I bar section 68 which is secured to the face 47 of the transfer casting 45. The spacing between centers of notches 67 obviously corresponds substantially to the spacing of lugs 65, so that, when the carriage is in transfer or switching position with respect to any of the rails 14, full opening movement of the gates 33 is permitted by entrance of the lugs into the slots, the relation of these parts best appearing in Fig. 8, their relation with respect to the carriage and transfer assembly being best shown in Fig. 4.

It will appear from Fig. 8 that the lugs 65 project, when the stops or gates 33 are closed, beneath the lower flange of the I bar of track 15. It thus appears as impossible, no matter what the position of the carriage with respect to track 15, to open or lift the gates 33, except when so definitely positioned that the lugs 65 may extend through the notches therefor.

In Figs. 10 and 11 I have illustrated a preferred construction of overhead track, the principles of this construction being somewhat generally applicable to overhead conveyer systems, but peculiarly applicable to an arrangement constructed according to the present disclosure. Due to the usual arcuate arrangement of roundhouse walls it is desirable to construct the trackage such as 15, of a generally arcuate form. I have found, however, that it is not necessary to employ curved sections of I bar intervening the several transfer stations 16; the same result being effectively attained by employing the much less expensive straight lengths of track between the stations, and providing a slightly angulate junction or joint between the several intervening track sections, and the short rail section 68 which forms a continuation and part of the trackage 15, and which is secured, preferably at the time of manufacture, to the casting 45. I have found that by cutting the bar section 68 of a generally trapezoidal shape, the normally right angular ends of the intervening straight sections of steel, will mate sufficiently closely thereto. While I have shown the opposite, angulately cut ends 69 of the bar section 68 as being of divergent relation, it is obviously possible to vary this angularity to meet any desired trackage layout; for example the opposite ends 69 might be parallel and each disposed at other than a right angle to the axis of the section 68, whereby to provide for conditions approximating a usual reverse curve. Numerous other modifications of the angularity of the bar ends 69 will be suggested according to conditions to be met. Physical connection between the several lengths of rail, may be made by means of plates 70, secured as by bolts 71, to the contiguous rail ends.

The operation and manner of use of the conveyer system described, is thought to be apparent from the preceding description of parts, but may be briefly referred to, for sake of completeness, as follows: Assuming the blower, indicated generally at 72 (Fig. 2) to be in the position of use on one of the lateral tracks 14, and desired to be conveyed to any other one of such lateral tracks. A suitable chain or like member (not shown) secured to the blower, enables it to be drawn to the

nearest transfer station 16. The end gates 54 at such location will be closed. Their mass is preferably such that, unless retained in open position as by the jaws 36 and mechanism associated with the carriage, the gates 54 will always be returned by gravity to the position shown in Fig. 4. It is therefore necessary, in order to open the gates 54, that the carriage first be brought in transfer position as shown in Fig. 4, in which the traveling track section 17 is in exact alignment with the track 14 from which it is desired to move the blower. The carriage being thus positioned, with the projection 61 between the ends 59 of stops or gates 54, actuation of chain 44 to rotate the sprocket 43, serves through shaft 42, pinions 40 and 39, to lift the gates 33 and therewith the gates 54. The blower then being moved to bring its trolley wheels 19 onto the track section 17, the gates 33, and therewith the gates 54, are again lowered, through manipulation of the chain 44. Until this is done, it will appear as impossible to move the carriage from the transfer station, since the position of projections 61 between the jaw portions 60 prevents any traveling manipulation of the carriage. This result is also independently provided for by the interengagement of projections 65 and notches 67. When the gates are lowered, the carriage may now be safely propelled by manipulation of chain 30, sprocket 29, shaft 28 and trolley wheels 21, to bring the carriage to any other desired transfer point or station 16 opposite the lateral alongside the stall track where the blower is next intended for use. During the time when the transfer carriage traverses the tracks 15 intervening the laterals 14, the gates 33 and end plate 25 positively prevent movement of the blower off of either end of the carriage track 17. During this time, and in fact except when the carriage is substantially in a switching or transfer position, it will appear as impossible to actuate the gates 33 to any appreciable extent from closed position, since, if this operation were attempted, only a preliminary lifting movement of the gates would result, prior to the time when the lugs 65 would engage the lower face of the I bar 15, thereabove. Any casual or accidental lifting of gates 33 during the time the blower or other apparatus is in transit, is thus rendered impossible.

As the carriage is brought to the next transfer or switching station and the track section 17 aligned with the desired track 14, the actuation of sprocket 43 through chain 44 is repeated, both sets of gates 33 and 54 are raised, and the trolley 19 moved onto the desired track 14. If it may be desired to utilize the carriage for conveyance of other blowers, the gates 33 and 54 may again be lowered while the blower is in use on one of the tracks 14. The ensuing cycle of operation is as before noted.

In certain existing popular types of equipment for conveying blowers of the type herein referred to, it is possible to utilize a blower on only one of two adjacent locomotive stall tracks. This results in a loss of time under conditions when two locomotives in adjacent stalls, are to be fired and drafted, at the same time. It will appear that, by use of the presently described transfer arrangement, any number of blowers may be used, up to the number of separate tracks 14 provided therefor; further that there is no restriction whatever as to the place in the installation where any one or plurality of such blowers may be used at the same time. Obviously, no more than one blower is necessary, at a given time, for each stall or track 14.

In addition to the numerous structural economies and advantages incident to the use of straight, as distinguished from curved trackage sections, it will also be noted that, as making for economy of materials and minimization of erection costs, the trackage employed for the entire system may be and is, by preference, of single-track type, as distinguished from the double or multiple tracks necessary in connection with cranes, gantries, and other typical conveyer installations heretofore prevailing. While certain monorail systems have heretofore been employed in connection with overhead trolley conveyers, the switching provisions have been, as far as has come to my knowledge, such that at least at the place of intersection, or switching points, double sections of track were heretofore regarded as necessary. In distinction, the present installation is by preference of monorail construction throughout, even to the transfer or switching stations.

It will appear from the foregoing description that the embodiment of my invention is simple, positive in operation, and reduces to a negligible minimum, the heretofore prevailing hazards attending the operation of overhead conveyer systems, all in furtherance and attainment of the several objects set forth above.

While the invention has been described in some considerable detail by reference to a specific executional embodiment thereof, employed for a particular selected purpose, the description is to be considered in a descriptive and not in a limiting sense, since a number of changes may be made in the parts described, their combinations, as well as in the purpose and utilization of the numerous possible embodiments, without departing from the spirit and full intended scope of the invention as defined by the claims hereunto appended.

I claim as my invention:

1. In an overhead conveyer system, in combination with a main trolley rail, a plurality of rails extended laterally thereof, a carriage operable on said main rail, a movable structure adapted to be transported by said carriage, and to be operated on said lateral rails, a gate at the end of each of said lateral rails, a gate on said carriage, gate operating mechanism on the carriage, and means preventing operative movement of said carriage gate, except when the carriage is in register with one of said lateral rails.

2. The combination with a fixed trolley rail and a movable rail, adapted to be moved into alignment therewith, of a movable gate on each of said rails, gate operating mechanism carried with the movable rail, and means on said movable rail gate for preventing actuation of said movable rail gate, when said rails are out of alignment.

3. In combination with a fixed and a movable trolley rail, a carriage for the movable rail, a track for the carriage, a pair of gates normally disposed to block one end of the fixed rail, means on the carriage for actuating said gates, a projection on the carriage, said gates being provided with extensions adapted to receive said projection therebetween whereby to prevent movement of the carriage away from the fixed rail, when said gates are in open position.

4. In combination, a fixed trolley rail, a trolley rail movable into alignment with the fixed rail, a carriage for the movable rail, a track for said carriage, a gate carried by the carriage, a gate near

the end of said fixed rail, means for operating said gates, carried by the carriage, and interlock mechanism carried in part by the carriage and in part by the fixed rail, for preventing movement of the carriage when said gates are in open position, and means adapted to prevent opening of the gate on said movable rail except when said rails are in alignment.

5. In a conveyer system, in combination, a fixed trolley rail, a movable trolley rail, means for bringing the rails into aligned position, means for locking the rails together against endwise displacement upon movement into alignment, said means including a member carried by one of said rails having a groove extending transversely of the rails and a tongue carried by the other of said rails adapted for reception in said groove, and means for locking the rails together against lateral displacement.

6. In an overhead conveyer system, a fixed rail, a movable rail, adapted to be brought into alignment with the fixed rail, a gate near the outer end of the fixed rail, a gate near the inner end of the movable rail, means for operating one of said gates, and interengaging portions on both of the gates, whereby operation of one, conjointly actuates the other, and interengaging means associated with said fixed and movable rails for locking said rails against endwise displacement.

7. In combination with a horizontal conveyer system of overhead type, a movable trolley rail, a fixed trolley rail, means for moving the movable rail into register with the fixed rail, a vertically sliding gate at the outer end of the fixed rail, a vertically sliding gate at the inner end of the movable rail, means for manually operating the movable rail gate, said means being carried by the movable rail, vertically spaced, horizontally projecting jaws on one of said gates, and a horizontal projection on the other of said gates adapted to be engaged by and between said jaws, whereby movement of the movable rail gate, concurrently actuates the gate on said fixed rail.

8. A trolley carriage for conveying a mobile apparatus, including a track section for the apparatus to be conveyed, a track for the carriage, means for propelling the carriage along said track, a gate for the track section, a rotatable shaft, a pinion on said shaft, a rack on said gate, engaging said pinion, and means for rotating said shaft, for lifting and lowering said gate.

9. A track gate for an overhead trolley track, including a pair of rack members movable into position across said track, a pair of pinions, in meshed engagement, and one thereof in engagement with each of said racks, a shaft operatively connected to one of said pinions, and means for actuating said shaft, to raise and lower the gate.

10. An overhead conveyer system including a carriage, a track for said carriage consisting of connected lengths of rail, a trolley rail on said carriage for an article to be transported thereby, a gate for said trolley rail tending normally to prevent movement of the conveyed article onto and off of said rail, said gate, in operative position, having a part subtending a portion of said carriage track and a rail section of said track having a recess adapted to clear the said subtending part, in one position of said carriage, whereby to permit opening movement of said gate.

11. In combination with a conveyer system of overhead type, a movable trolley rail, a fixed trolley rail, means for guidingly moving the movable rail into register with the fixed rail, a gate at the outer end of the fixed rail, a gate at the inner end of the movable rail, means for operating the movable rail gate, said means being carried by the movable rail, jaws on one of said gates, and a projection on the other of said gates, adapted to be engaged by said jaws, whereby movement of the movable rail gate, concurrently actuates the gate on said fixed rail, and a projection on the movable rail, coacting with the gates on said fixed rail, to prevent movement of the movable rail when said last named gates are in raised position.

12. In an overhead conveyer system, a fixed rail, a rail adapted for movement into alignment with the fixed rail, a member associated with said movable rail, and means associated with said fixed rail cooperable with said member to prevent endwise and lateral displacement of said movable rail relative to said fixed rail.

13. In an overhead conveyer system, a fixed rail, a rail movable into alignment with the fixed rail, a gate on said fixed rail including paired, laterally spaced members, a stationary element extending between said spaced gate members, an element associated with said movable rail adapted to engage said stationary element when the rails are disposed in alignment and thereby to prevent relative endwise displacement of the rails, said spaced gate members serving, when in open-gate position, to engage said last named element whereby to prevent lateral movement of said movable rail.

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